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24. The device of Claim 23, further comprising encapsulant enclosing said active surface of said chip, said bonding wires, and at least a portion of said substrate.

25. The device of Claim 24, wherein the average modulus of elasticity of the composite attachment film is higher than the modulus of elasticity of said encapsulant.

REMARKS

Reconsideration of the above-referenced application in view of the following remarks is respectfully requested.

Claims 1-21 were pending in this application. Non-elected Claims 18-21 have been cancelled without prejudice. New Claims 22-25 have been added. Claims 1 and 14 have been amended to better define the scope of the claimed invention.

Applicant thanks the Examiner for indicating the allowability of Claims 9 and 10-13.

Claims 1-5 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Miyaake, et al. (U.S. 6,333,466) in view of Chung (U.S. 6,376,769). Claim 1 is directed to a multilayer composite attachment film, whereas Miyaake discloses a flexible wiring board. An attachment film is distinct from a wiring board as is evident in Figures 13-15 of the instant specification, where the attachment film 801, 802, 803 is used in attaching chip 901 to substrate (i.e. wiring board) 1301. In order to make this distinction clearer in the claim, Claim 1 has been amended to state that the metal foil is unpatterned. Thus, the metal foil of the attachment

layer in the invention described in Claim 1 cannot be confused with a wiring board in which a circuit pattern is formed in a foil (see Miyaake, col. 3, lines 44-49). Chung does not teach or suggest a multilayer composite attachment film and therefore does not cure the deficiencies of Miyaake. Applicant respectfully requests that the rejection of Claim 1 be withdrawn since the combination of Chung and Miyaake does not teach or suggest all of the features of the claimed invention. Claims 2-5 depend from Claim 1 and are therefore patentable over the references of record for at least the reasons presented above.

Claims 6-17 stand rejected under 35 U.S.C. 103(a) as being unpatentable over Chung (U.S. 6,376,769) in view of Miyaake, et al. (U.S. 6,333,466). Claim 6 includes the feature of "a semiconductor chip having an active and a passive surface, said passive surface adhesively attached to a substrate film by means of a multilayer composite; said composite comprising a metal foil having first and second surfaces and an adhesive layer attached on each of said surfaces." The Examiner points to Chung's Figure 3 for a teaching of such a multilayer composite. However, Chung's Figure 3 shows chip 120 attached to interposer 110 with flexible dielectric underfill adhesive 126, not a multilayer composite. The interposer 110 is then attached to next-level substrate 140 using contacts 114 and solder ball connections 134, but the passive surface of the chip itself is attached only to interposer 110. As discussed above, Miyaake does not teach or suggest such a multilayer composite attachment film. Therefore, Applicant respectfully requests that the rejection be withdrawn since the cited references, taken individually or in combination, fail to teach or suggest all of the claimed features.

Claim 7 depends from Claim 6 and is therefore patentable over the cited references for at least the reasons presented above. In addition, Claim 7 includes the feature wherein "said substrate film [is] attached to the adhesive on said second foil surface." In contrast, in Chung's Figure 3, the interposer 110 is attached to substrate 140 using solder ball connections 134. There is no suggestion in Chung of attaching interposer 110 to substrate 140 with adhesive.

Claims 16 and 17 depend from Claim 6 and are therefore patentable over the cited references for at least the reasons presented above for that claim.

The Office Action contains no support for the statement relating to Claim 8. No reference to the cited references is provided. Therefore, Applicant respectfully requests that the rejection be withdrawn.

Claim 14 has been amended to make it depend from Claim 12 rather than Claim 6 in order to provide antecedent basis for the bonding wires. The Examiner points to Chung's Figure 7 in support of the rejection of Claim 14, but Figure 7 does not show bonding wires. In addition, both Claim 14 and 15 depend from Claim 6 and are therefore patentable over the cited references taken individually or in combination for at least the reasons presented above for that claim.

Applicant respectfully requests reconsideration and withdrawal of the rejections and allowance of Claims 1-17 and 22-25. If the Examiner has any questions or other correspondence regarding this application, Applicant requests that the Examiner contact Applicant's attorney at the below listed telephone number and address.

Respectfully submitted,



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VERSION WITH MARKINGS TO SHOW CHANGES MADE

In the Claims:

1. (amended) A multilayer composite attachment film for use in assembling semiconductor devices, comprising:

an unpatterned [a] metal foil having first and second surfaces; and
an adhesive layer attached on each of said surfaces;
whereby said multilayer composite has an average modulus greater than
the modulus of a polymerized encapsulation material.

14. (amended) The device according to Claim 12 [6] further comprising a protective encapsulation, said encapsulation enclosing said active chip surface, said bonding wires, and portions of said first surface of said composite.

Please cancel non-elected claims 18-21 without prejudice.

Please add the following new claims:

22. A semiconductor device comprising:

a semiconductor chip having an active and a passive surface;
a composite attachment film comprising a metal foil having first and second surfaces and an adhesive layer on each of said surfaces of said metal layer; said passive surface of said chip attached to said adhesive layer on said first surface of said metal foil; and
a substrate; wherein said adhesive layer on said second surface of said metal foil is attached to said substrate.

23. The device of Claim 22, further comprising bonding wires attaching said active surface of said chip to said substrate.

24. The device of Claim 23, further comprising encapsulant enclosing said active surface of said chip, said bonding wires, and at least a portion of said substrate.
25. The device of Claim 24, wherein the average modulus of elasticity of the composite attachment film is higher than the modulus of elasticity of said encapsulant.